CLAIMS:

1. An ignition coil for an engine comprising:

a central core assembly including a rod-shaped core;

a primary spool and a secondary spool arranged around an outer circumference of the central core assembly;

a primary coil wound on the primary spool and a secondary coil wound on the secondary spool;

an insulating resin member filled around the core; and

a first buffer member covering two longitudinal end corners of the central core assembly.

2. The ignition coil of claim 1, further comprising:

a second buffer member arranged at at least one of the two longitudinal ends of the central core assembly.

3. The ignition coil of claim 1, wherein:

the first buffer member is formed into a tube shape and has a hole in at least one of the two longitudinal ends of the central core assembly; and

the hole is smaller in diameter than the central core assembly.

4. An ignition coil for an engine comprising:

a central core assembly including a rod-shaped core;

a primary spool and a secondary spool arranged around the outer circumference of the central core assembly;

a primary coil wound on the primary spool and a secondary

coil wound on the secondary spool; and

an insulating resin member filled around the core, wherein at least one of the two longitudinal end corners of the central core assembly is surrounded by a space.

5. The ignition coil of claim 4, further comprising:

a first buffer member arranged to cover the other of the two longitudinal end corners of the central core assembly; and

a second buffer member arranged at at least one of two longitudinal ends of the central core assembly.

6. The ignition coil of claim 5, further comprising:

a case member enclosing the outer circumference of the central core assembly,

wherein the second buffer member provides a sealing between a longitudinal end face of the central core assembly in the space and the case member.

7. An ignition coil for an engine comprising:

a rod-shaped core;

a primary coil and a secondary coil wound on an outer circumference of the core;

a primary spool having the primary coil wound thereon, and a secondary spool having the secondary coil wound thereon;

an outer core arranged around the outer circumferences of the primary coil and the secondary coil;

a resin insulator filled around the core; and

an angled member covering the inner circumference corner of a longitudinal end potion of the outer core.

8. The ignition coil of claim 7, wherein:

the angled member covers the inner circumference corner of the longitudinal end which is positioned at a high voltage side of the secondary coil.

9. The ignition coil of claim 7, wherein:

the angled member covers the inner circumference corner of the end which is positioned at the low voltage side of the secondary coil.

10. The ignition coil of claim 9, wherein:

the primary spool is arranged around the outer circumference of the secondary coil; and

the angled member is mounted in a fitting member formed in the primary spool.

11. The ignition coil of claim 7, wherein:

the angled member covers the inner circumference corner of the end portion in an L-shaped section assembled with the outer core.

12. The ignition coil of claim 7, wherein:

end portions located at the low voltage side of the secondary coil of the primary spool and the secondary spool which

is arranged at the outer circumference side is extended longer in the longitudinal direction than an end portion of the outer core.

13. The ignition coil of claim 12, wherein:

the primary spool is arranged around the outer circumference of the secondary spool.

14. The ignition coil for an engine comprising:

a rod-shaped core;

a primary coil and a secondary coil wound on an outer circumference of the core;

a primary spool having the primary coil wound thereon, and a secondary spool having the secondary coil wound thereon;

an outer core arranged around outer circumferences of the primary coil and the secondary coil; and

a resin insulator filled around the core,

wherein at least of the primary spool and the secondary spool has a flange formed at a longitudinal end portion thereof and extending radially to cover the longitudinal end portion of the outer core.

15. The ignition coil of claim 14, wherein:

the primary spool is arranged around an outer circumference of the secondary spool, and

the flange is formed in the primary spool at the low voltage side of the secondary coil.

16. An ignition coil for an engine comprising:

a central core assembly including a rod-shaped core;

a primary coil and a secondary coil wound on an outer periphery of the core;

a primary spool around which the primary coil is wound and a secondary spool around which the secondary coil is wound; and

a resin insulator filled around the core,

wherein an inner peripheral part and an outer peripheral part are separated to expand/contract separately from each other.

17. The ignition coil of claim 16, further comprising:

a separating member interposed between the inner peripheral part and the outer peripheral part.

18. The ignition coil of claim 17, wherein:

the separating member is interposed between the primary spool and the primary coil.

19. The ignition coil of claim 18, wherein:

the primary spool functions also as the separating member.

20. The ignition coil of claim 16, wherein:

the primary spool is pasted with a separating material.

21. The ignition coil of claim 16, wherein:

the primary coil is pasted with a separating material.

22. The ignition coil of claim 16, wherein:

the primary coil has a wire material covered by a material which hardly adheres with the resin insulator.

23. The ignition coil of claim 16, wherein:

a surface of the primary spool is separated from a member in contact with a surface of the primary spool to expand/contract separately.

24. The ignition coil of claim 16, further comprising:

an outer core disposed around the primary coil and the secondary coil and having an inner peripheral surface which is separated from a member in contact with the inner peripheral surface of the outer core to expand/contract separately.

25. An ignition coil for an engine comprising:

a central core assembly including a rod-shaped core;

a primary coil and a secondary coil wound on an outer periphery of the central core assembly; and

a resin insulator filled around the core,

wherein at least one of the primary coil and the secondary coil has a wire coated by a separating material which is separable from the resin insulator.

26. The ignition coil of claim 25, wherein:

one of the primary coil and the secondary coil disposed radially outside has the wire coated by the separating material.

27. The ignition coil of claim 25, wherein:

the primary coil is disposed at a radially inner side and the secondary coil is disposed at a radially outer side.

28. An ignition coil for an engine comprising:

a cylindrical core;

a primary coil and a secondary coil wound around an outer periphery of the core;

a primary spool around which the primary coil is wound and a secondary spool around which the secondary coil is wound; and

a resin insulator filled around the core,

wherein a resin material for molding at least inner one of the primary spool and the secondary spool contains more than 5 weight % of rubber component and a reinforcing material for suppressing plastic deformation.

29. The ignition coil of claim 28, wherein:

the secondary coil is disposed on an inner periphery side of the primary coil.

30. The ignition coil of claim 28, wherein:

the resin material contains at least either one of PPE, PS and PBT.

31. The ignition coil of claim 28, wherein:

the rubber material has a glass transition point temperature Tg which is less than -30 ℃.

32. The ignition coil of claim 28, wherein:

the resin material has a solution viscosity which is less than 0.5.

33. The ignition coil of claim 28, wherein:

the resin insulator is filled between the core and one of the primary spool and the secondary spool; and

a material having a coefficient of thermal expansion lower than that of the resin material is disposed at least in the vicinity of and almost all around the outer periphery of the core.

34. An ignition coil for an engine comprising:

a cylindrical core;

a primary coil and a secondary coil wound around an outer periphery of the core;

a primary spool around which the primary coil is wound and a secondary spool around which the secondary coil is wound; and

a resin insulator filled between the core and inner one of the the primary spool and the secondary spool,

wherein a material having a thermal expansion coefficient lower than that of the resin insulator is disposed at least in

the vicinity of and almost all around the outer periphery of the core.

35. An ignition coil for an engine comprising:

a rod-shaped central core;

a primary coil and a secondary coil arranged around an outer circumference of the central core; and

an insulator filled around the core and flexible.

36. The ignition coil of claim 35, wherein:

the insulator has a cold modulus of elasticity within a range of 0.1 to 5,000 MPa in a test method corresponding to ASTMD790.

37. The ignition coil of claim 36, wherein:

the insulator has a cold modulus of elasticity within a range of 10 to 5,000 MPa in the test method corresponding to ASTMD790.

38. The ignition coil of claim 35, wherein:

the insulator includes an inner insulator and an outer insulator;

the inner insulator has a cold modulus of elasticity within a range of 0.1 to 10 MPa in the test method corresponding to ASTMD790 and is mounted to contact directly with the central core; and

the outer insulator has a cold modulus of elasticity

larger than 10 MPa in the test method corresponding to ASTMD790 and fills around the inner insulator.

39. The ignition coil of claim 38, wherein:

the outer insulator has a cold modulus of elasticity larger than 3,000 MPa in the test method corresponding to ASTMD790.

40. An ignition coil for an engine, comprising:

a rod-shaped central core;

a primary coil and a secondary coil arranged around an outer circumference of the central core; and

an insulator filled around the core and having an average of a thermal expansion coefficient within a range of 10 to 30 ppm at -40 °C to 130 °C in a test method corresponding to ASTMD790.

41. The ignition coil of claim 40, wherein:

the insulator has an average of the thermal expansion coefficient within a range of 10 to 30 ppm at a room temperature to 70 °C in the test method corresponding to ASTMD696.

42. The ignition coil of claim 40, wherein:

the insulator has an average of a thermal expansion coefficient within 10 to 30 ppm.

43. The ignition coil of claim 40, wherein:

the insulator includes an inner insulator and an outer

insulator;

the inner insulator has an average of the thermal expansion coefficient within a range of 10 to 30 ppm at a room temperature to 70 °C in the test method corresponding to ASTMD696 and is mounted to contact directly with the central core; and

the outer insulator has an average of the thermal expansion coefficient larger than 17 ppm at the room temperature to 70 °C in the test method corresponding to ASTMD696 and is mounted around the inner insulator.

44. The ignition coil of claim 43, wherein:

the inner insulator has an average of the thermal expansion coefficient within a range of 11 to 17 ppm at the room temperature to 70 °C in the test method corresponding to ASTMD696.